

Before the
Federal Communications Commission
Washington, D.C.

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FEDERAL COMMUNICATIONS COMMISSION
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In the Matter of:

Petition of the Intelligent
Transportation Society of America
for Amendment of the Commission's
Rules To Add Intelligent Transportation
Services (ITS) as a New
Mobile Service With Co-Primary Status
in the 5.850 to 5.925 GHz Band

RM 9096

COMMENTS OF THE
UNITED STATES DEPARTMENT OF TRANSPORTATION

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The Intelligent Transportation Society of America ("ITS America") in the above-referenced proceeding has petitioned the Federal Communications Commission ("FCC" or "Commission") to allocate spectrum for use by a new mobile service technology known as Dedicated Short Range Communications ("DSRC"). DSRC is an enabling technology, one that makes possible a broader host of systems and services -- collectively termed Intelligent Transportation Systems ("ITS") -- that Congress has deemed important to improving the safety and efficiency of the nation's transportation infrastructure. The United States Department of Transportation ("DOT" or the "Department") supports the allocation of spectrum for DSRC services in order to advance this goal, for a permanent allocation is necessary to ensure national compatibility and reliability, which are in turn critical to the widespread deployment of DSRC services that will transform transportation. The ITS America petition deserves serious consideration as a basis for such an allocation, for it seeks spectrum on behalf of current and future users of DSRC services and it does so in a way that promotes spectrum efficiency.

Introduction

Surface transportation systems -- the networks of highways, local streets, bus routes, and rail lines -- are the ties that bind communities and facilitate commerce, connecting businesses and residents to work, homes, schools, services, and each other. During the past 20 years, however, transportation systems have struggled to keep pace with Americans' growing and changing travel needs. The General Accounting Office has projected that congestion in metropolitan areas could worsen by 300 to 400 percent over the next 15 years unless significant changes are made. Transportation in the aggregate, particularly when affected by these factors, poses an environmental threat as well. Finally, traffic accidents now claim more than 41,000 lives each year. Congress has decided to add new tools to the transportation system. Rather than continuing to rely simply upon quantitative additions to the existing transportation infrastructure, Congress has chosen to also emphasize the use of technology to improve the performance of that infrastructure.

The Intermodal Surface Transportation Efficiency Act of 1991, Pub. L. 102-240, 105 Stat. 1914 ("ISTEA"), charged the Department with creation of a national program to enhance environmental, safety, efficiency, and economic goals by means of what has come to be known as intelligent transportation systems.¹ DOT has sought to further the development and deployment of ITS in various ways. First, in close cooperation with many public and private partners throughout the U.S. (including ITS America and its members),² we defined the elements of the National ITS Program. Foremost among these are the National Program Plan and the National ITS Architecture. See ITS America Petition ("Petition"), Attachments C and F, respectively.³ Together they identify the 30 "user services" or applications that comprise the collaborative public/private vision for ITS over the next two decades, as well as the technological framework for implementing them. The National ITS Architecture identifies wireless DSRC as the most appropriate medium, in whole or in part, for eleven of these services.⁴ DSRC is therefore a

¹/ See Pub. L. 102-240, Part B, §§ 6052-6054. ISTEA originally used the term "intelligent vehicle-highway systems."

²/ ITS America is an advisory committee to DOT under the terms of the Federal Advisory Committee Act, P.L. 92-463, 86 Stat. 770 (1972) *codified at* 5 U.S.C. Appendix 2.

³/ DOT understands that a complete two-volume set of the National ITS Program Plan has been filed with the Commission.

⁴/ DSRC systems consist of vehicle-mounted transponders that communicate in the microwave band with roadside "readers."

critical component of the realization of the ITS Program Plan.

ISTEA provides authorization for ITS and other programs through September 31, 1997. The Administration has proposed successor legislation, the National Economic Crossroads Transportation Efficiency Act ("NEXTEA"). H.R. 1268, 105th Cong., 1st Sess., 143 Cong. Rec. 1437 (1997), which we hope that Congress will enact before the end of this fiscal year. NEXTEA provides for the accelerated deployment of proven ITS technologies, including DSRC. The goals of this legislation include implementation of an integrated, intermodal, interoperable intelligent transportation infrastructure, and the development of a technology base as well as necessary standards and protocols for ITS. Specifically, the bill's language states that:

The Secretary [of Transportation] shall develop, implement, and maintain a National Architecture and supporting standards and protocols to promote the widespread use and evaluation of intelligent transportation systems technology as a component of the Nation's surface transportation systems. To the extent practicable, such standards and protocols shall promote interoperability among intelligent transportation systems technologies implemented throughout the States. In carrying out this subsection, the Secretary may use the services of such existing standards-setting organizations as the Secretary deems appropriate. The Secretary shall consult with the Secretary of Commerce, the Secretary of Defense, and the Federal Communications Commission, and *take all actions the Secretary deems necessary to secure the necessary spectrum for the near-term establishment of a dedicated short-range vehicle-to-wayside wireless standard.*

Section 6054(b) (emphasis supplied).

The Department has reviewed the ITS America petition in light of our ITS responsibilities and with the expectation that these will continue. From this perspective we have found that there is much to recommend in the petition. From the perspective of ISTEA, it appears to fully meet the needs of the DSRC portion of the National ITS Program by providing an adequate amount of the necessary underlying spectrum to accommodate existing and developing technologies. It does so on a nationwide basis, which promotes investment and deployment. It is also important to the Department that the allocation sought by ITS America is consistent with principles we urged upon the Commission in WT Docket 96-86, FCC 96-155. That proceeding addresses the Public Safety Wireless Advisory Committee's

findings on the spectrum needs of public safety; in its comments DOT emphasized the need for interoperability, for enhanced spectral efficiency, and for recognition of public safety's international component in varied circumstances.⁵ The instant petition is responsive to each of these: it seeks a nationwide allocation, it envisions shared use of the spectrum, and it follows international trends toward standardization on this band for DSRC services.

The Department wishes to underscore that it does not espouse any particular technological approach to implementing DSRC services. We seek only to carry out ISTEA's mandate and thereby achieve the benefits of ITS for the American public.⁶ DOT anticipates that this proceeding will encourage timely debate and the resolution of key technical issues regarding widespread DSRC implementation.

A New Allocation of Spectrum for DSRC Services is in the Public Interest

Federally sponsored ITS research, testing, and deployment performed pursuant to ISTEA has demonstrated the benefits achievable through the use of ITS technologies. *See, e.g., Intelligent Transportation Infrastructure Benefits: Expected and Experienced*, a DOT publication reproduced as Attachment G to the petition. As previously noted, ITS promotes public safety: not only do several ITS user services address directly the safety and security of the traveling public, but others also offer new technologies and services for vehicles owned and operated by emergency service providers and traditional public safety agencies. *Id.*

The Department has emphasized the use of existing communications facilities and services to meet many of the communication needs of ITS. For example, we have sponsored research, testing, and actual deployment of ITS services that use, variously, cellular phones, personal digital assistants, FM subcarrier, and the Internet, just to name a few. The ITS Program has also championed the sharing of wireline telecommunications resources between public and private entities to support infrastructure communications for traffic management systems. We believe that where the need for wireline, wide-area wireless, and broadcast communications to support ITS services have been identified, the existing infrastructure, technologies, and spectrum are sufficient. However, in the case of DSRC, the Department submits that the allocation of new spectrum is needed to

⁵/ DOT Comments at 8-15 (filed October 21, 1996); DOT Reply Comments at 2-4 (filed December 19, 1996).

⁶/ ITS America accurately summarizes those benefits. Petition at 9-30.

support the requirements of emerging services -- particularly those with public safety implications -- as well as the growth and interoperability of existing services.

DOT is also aware that DSRC is used today, primarily in the 902-928 MHz band, for electronic toll collection and certain regulatory transactions for commercial vehicles, using a variety of proprietary systems and protocols. There are approximately 2 million 'tags' in circulation today just for toll collection, a number that has doubled each of the past two years and will continue to grow rapidly. This growth and its anticipated future course illustrate in a relatively small way the promise of widespread DSRC deployment and expansion into new services. However, even if many of these services remain in the 902-928MHz band -- as we fully expect they will -- the increasing congestion from ITS and non-ITS services, the limited bandwidth, and the secondary status of DSRC in this band make this region of spectrum unacceptable for application of the other envisioned DSRC services, especially those that play a role in public safety.

DOT thus now considers that there is a need for significant additional spectrum for DSRC services. Public safety and other valuable uses of DSRC technologies demand reliability and national interoperability. Once these needs are met, the attraction of the services will promote their widespread deployment. Sound public policy would also allow for quantitative and qualitative growth in relevant technologies. The only sure way to put these synergies in motion is with a new allocation.

In the sections that follow DOT will address (1) the fundamental needs of time- and safety-critical applications of DSRC technology; (2) the necessity for compatibility and interoperability in DSRC applications; and (3) the ongoing development of new ITS applications. The Department will also discuss the efforts it is undertaking to measure, and if possible ensure, the ability of DSRC services to share the 5.8 GHz band at issue with incumbent users.

DSRC Applications Enhance the Public Safety

ITS technologies address ISTEA's goal of enhanced public safety by reducing the frequency of accidents, reducing the severity of accidents, reducing congestion due to incidents, and enhancing traveler security. They do so via the following safety-related functions, described in the ITS National Program Plan:

- smoothing traffic flows
- improving emergency and roadway services responsiveness
- improving passenger protection

- improving response to hazardous materials ("HAZMAT") incidents
- improving incident management
- improving incident information to drivers
- improving on-board system monitoring
- improving the availability of emergency communications
- increased monitoring of transportation facilities
- reducing the number of impaired drivers
- enhancing driver performance
- enhancing vehicle control capability

Police, fire, highway maintenance, forestry-conservation (including fire-fighting units), local government, and emergency medical radio services are currently eligible for frequency assignments in the Public Safety Radio Services administered by the FCC. These agencies are all critical to portions of the ITS Architecture, and many communications systems that could support ITS applications exist among these services.

For this reason, the Department's ITS Joint Program Office ("JPO") participated extensively in the activities of the Public Safety Wireless Advisory Committee ("PSWAC"), whose work the FCC has considered crucial in the effort to adopt sound policies and rules for public safety uses of the spectrum. WT Docket 96-86. The JPO played a leading role in developing operational and interoperability requirements for public safety communications systems. These requirements are formally documented in the PSWAC Final Report.⁷ The recommendation of the PSWAC Spectrum Subcommittee is especially pertinent to the spectrum sought by ITS America:

5850 to 5925 MHz: Although not a part of the spectrum being transferred from the Federal Government, the [National Telecommunications and Information Administration] recommends this band for Intelligent Transportation Systems (ITS) use, which has public safety-related requirements. The subcommittee believes ITS systems should be developed in their own band allocations. However, it is anticipated that public safety and public service agencies will be able to request frequency assignments in this band for safety-related ITS applications. Therefore, the subcommittee supports the NTIA recommendation.

PSWAC Final Report, Volume II, Appendix D, § 6.4.

⁷/ Final Report of the Public Safety Wireless Advisory Committee to the Federal Communications Commission and the National Telecommunications and Information Administration, September 11, 1996.

DOT filed extensive comments and reply comments in WT Docket 96-86. We identified the federal interest in promoting “the development of systems that serve such purposes as advanced traffic control, vehicle location, crash avoidance, and enhanced communications for traditional public safety agencies. ITS technologies are designed to aid in assessing and reporting traffic, road, and weather conditions; facilitating emergency responses to natural disasters and accidents involving all modes of transportation; and enhancing the security of the traveling public.” Initial Comments at 4. Our reply comments in particular documented the ways in which DSRC services can enhance the performance of public safety services and enhance public safety directly, and we urged that the Commission “keep this array of relatively unconventional yet significant spectrum uses in mind as it considers decisions in this [public safety] proceeding.” Reply Comments at 8.

DSRC promises to introduce many other new and emerging services with safety implications. For example, future applications, such as automated roadside safety inspection, tracking of hazardous materials, and automatic equipment monitoring, will be built onto existing applications over time. Emergency response vehicles and transit vehicles will have improved response time and schedule adherence with DSRC control of traffic signals. Traffic managers will detect and reduce the level of traffic congestion with the use of DSRC traffic probes.

The permanent allocation of a band where these enhanced applications can operate on a co-primary basis will both allow ITS to support public safety goals and satisfy the recommendation of the PSWAC in this regard.

DSRC Compatibility and Interoperability Require a New Allocation of Spectrum

The Department has already begun the technical preparations necessary for further development and widespread deployment of DSRC technology. The National Telecommunications and Information Administration (“NTIA”) in 1996 granted a DOT operating administration, the Federal Highway Administration (“FHWA”), experimental use of the 5.850 - 5.925 GHz band for research, development, and testing of ITS applications for a 15 year period. Petition, Appendix J. This authorization was obtained to make spectrum available for DSRC technology testing and development, compatibility testing with incumbents, and to facilitate development and testing of standards for nationwide interoperability.

Testing is currently underway to evaluate the performance of existing DSRC systems that are not yet in commercial use in the U.S., in preparation for further

performance capability and electromagnetic compatibility testing. Testing and analysis will also verify the degree to which projected ITS needs will in fact be satisfied by the proposed allocation for DSRC, and the degree to which the spectrum can be shared with currently authorized users. This testing is being carried out by ARINC and the NTIA's Institute for Telecommunications Sciences under DOT sponsorship.

DOT has also launched a number of initiatives aimed at establishing national standards and encouraging the integration of DSRC applications. To that end we are funding the development of DSRC standards through recognized standard-setting organizations, including the Institute of Electrical and Electronics Engineers ("IEEE") and the American Society of Testing and Materials ("ASTM").⁸ Ultimately, we anticipate that these efforts will lead to consensus DSRC standards among industry and users. Standards for DSRC that span the range of applications, together with a nationwide frequency allocation, are necessary to achieve Congress' vision of an enhanced transportation infrastructure, which entails seamless, nationwide interoperability for ITS services.

Innovative New Uses for DSRC Require a New Allocation of Spectrum

Several projects are planned or underway at international border crossing sites in Arizona, California, Michigan and New York. Commercial vehicle regulatory agencies in these states, their counterparts in Canada and Mexico, and customs and immigration officials in all three countries are all participants. DSRC applications will help process the increased transborder traffic ushered in by the North American Free Trade Agreement ("NAFTA") by providing an expeditious, near transparent border crossing. The project entails the use of in-vehicle units communicating with other DSRC units near toll, customs, immigration, and transportation safety facilities. Each country is also developing its own electronic database to collect and process commercial data that are sent via the Internet from motor carriers and international shipping companies prior to travel. It is important to note that transportation officials report frustration over the lack of technological standards for transponders. Carriers and state agencies are hesitant to invest in

^{8/} For example, ASTM is addressing the full range of standards, recommended practices, and informational reports required to provide compatible and interoperable DSRC services. ASTM will approve draft standards for both physical and data link layers. IEEE is researching and consolidating information that will lead to the publication of a single open industry standard message set for DSRC. The first phase of the project addresses commercial vehicle operations and electronic toll collection applications.


preclearance technology because they fear their investment will be worthless should services operating under different protocols emerge. The allocation of a new frequency band for expanded DSRC-implemented ITS functions would allow for development of a reliable, secure system that can provide nationwide interoperability using a standard physical and data link layer protocol.

Conclusion

The Department supports the allocation of spectrum for DSRC services in support of ITS applications. The ITS America petition offers much that would bring about the ITS-enhanced transportation infrastructure ordained by Congress. This technology will enhance the safety of the traveling public, help streamline commercial vehicle operations, reduce federal, state, and local government regulatory burdens, and improve traffic management, transit operations, and emergency response. Moreover, preliminary analysis shows that band sharing with incumbents is feasible. Should scheduled tests confirm this finding, DSRC services would impart their benefits in a spectrally efficient manner as well. DOT will continue to support efforts to reach consensus on technical standards and full national and continental interoperability, and to encourage projects that will demonstrate the diverse benefits of DSRC services.

The Department commends the FCC for acting promptly on this important matter, and we urge the Commission to use this proceeding to secure the broad input necessary to resolve issues related to implementation of DSRC services.

Respectfully submitted,


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July 28, 1997